

This listing of claims will replace all prior versions,
and listings, of claims in the application:

1 Claim 1 (previously presented): An antenna apparatus for
2 use with a digital communications channel over which a
3 multi-bit digital control signal is communicated, said
4 antenna apparatus supporting a plurality of antenna pattern
5 positions, different ones of said antenna pattern positions
6 being identified by different predetermined position
7 indicator values, the antenna apparatus comprising:
8 control circuitry, coupled to the digital
9 communications channel, the control circuitry including a
10 direction control device for receiving said multi-bit
11 digital control signal, said digital control signal
12 including one of said predetermined position indicator
13 values and at least one other control value, and for
14 generating at least one antenna pattern position control
15 signal from said digital control signal and one additional
16 control signal; and
17 a controllable antenna element assembly having a
18 steerable antenna pattern including a plurality of regions
19 including at least a first region having a first gain and a
20 second region having a second gain which is lower than said
21 first gain, the controllable antenna element assembly being
22 responsive to said at least one antenna pattern position
23 control signal.

1 Claim 2 (original): The apparatus of claim 1, wherein said
2 digital communications channel is a serial bus.

1 Claim 3 (previously presented): An antenna apparatus for
2 use with a digital communications channel over which a

3 multi-bit digital control signal is communicated, said
4 antenna apparatus supporting a plurality of antenna pattern
5 positions, different ones of said antenna pattern positions
6 being identified by different position indicator values,
7 the antenna apparatus comprising:

8 control circuitry, coupled to the digital
9 communications channel, the control circuitry including a
10 direction control device for receiving said multi-bit
11 digital control signal, said digital control signal
12 including one of said predetermined position indicator
13 values and at least one other control value, and for
14 generating at least one antenna pattern position control
15 signal from said digital control signal; and

16 a controllable antenna element assembly having a
17 steerable antenna pattern including a plurality of regions
18 including at least a first region having a first gain and a
19 second region having a second gain which is lower than said
20 first gain, the controllable antenna element assembly being
21 responsive to said at least one antenna pattern position
22 control signal, said controllable antenna element
23 outputting a received signal onto said communications
24 channel; and

25 wherein said communications channel is implemented
26 using a coaxial cable over which both the received signal
27 and said multi-bit digital control signal are communicated.

1 Claim 4 (previously presented): An antenna apparatus for
2 use with a digital communications channel over which a
3 digital control signal including antenna pattern position
4 control information is communicated, the apparatus
5 comprising:

6 control circuitry, coupled to the digital
7 communications channel, the control circuitry including a
8 direction control device for generating at least one
9 antenna pattern position control signal from said digital
10 control signal; and

11 a controllable antenna element assembly having a
12 steerable antenna pattern including a plurality of regions
13 having different gains, the controllable antenna element
14 assembly being responsive to said at least one antenna
15 pattern position control signal;

16 wherein said digital control signal includes an
17 antenna position portion and a gain control portion, and

18 wherein the control circuitry includes a gain
19 decoder for generating a gain control signal as a function
20 of the gain control portion of said control signal.

1 Claim 5 (original): The apparatus of claim 4,

2 wherein said digital control signal further
3 includes a channel number portion, and

4 wherein the control circuitry further includes
5 channel number processing circuitry for generating a tuning
6 voltage as a function of the channel number portion of said
7 digital control signal.

1 Claim 6 (original): The apparatus of claim 5, further

2 comprising a tuning circuit coupled to said antenna element
3 assembly, the tuning circuit being responsive to the tuning
4 voltage.

1 Claim 7 (original): The apparatus of claim 4,

2 wherein said digital control signal further
3 includes a polarization control portion, and

4 wherein the control circuitry further includes a
5 polarization control circuit coupled to said antenna
6 element assembly.

1 Claim 8 (original): The apparatus of claim 6, further
2 comprising:

3 a memory device including antenna capabilities
4 information.

1 Claim 9 (original): The apparatus of claim 8, wherein said
2 controllable antenna element assembly includes:

3 a plurality of individual antenna elements; and
4 at least one switch being coupled to each of the
5 individual antenna elements, each switch being coupled
6 to said direction control device.

1 Claim 10 (original): The apparatus of claim 8, wherein
2 said control circuitry includes at least one integrated
3 circuit for performing a decoding operation on at least a
4 portion of said digital control signal.

1 Claim 11 (original): The antenna apparatus of claim 10,
2 further comprising a coupling device including at least
3 three connections, the first connection for coupling said
4 digital communication channel to a control line of a
5 receiver, the second connection for coupling said
6 controllable antenna element assembly to a signal input of
7 said receiver, and a third connection for coupling the
8 control circuitry to a power supply line of said receiver.

1 Claim 12 (previously presented): A receiver apparatus,
2 comprising:

3 a tuner for receiving a broadcast signal from an
4 antenna device;
5 a received broadcast signal processing circuit
6 for generating at least one signal measurement value from
7 said received broadcast signal;
8 an antenna controller for generating a digital
9 antenna control signal including at least one of gain
10 information, polarization control information, and channel
11 number information, in addition to antenna pattern position
12 control information, the antenna pattern position control
13 information being determined by said antenna controller as
14 a function of said at least one signal measurement value;
15 and
16 a communications channel for outputting the
17 digital antenna control signal to said antenna device.

1 Claim 13 (original): The apparatus of claim 12, wherein
2 said received broadcast signal processing circuit is a
3 demodulator and wherein said at least one signal
4 measurement value is a signal to noise estimate.

1 Claim 14 (original): The apparatus of claim 12, wherein
2 said communications channel is a serial data bus.

1 Claim 15 (original): The apparatus of claim 14, wherein
2 said antenna controller includes:
3 an antenna control and positioning routine used
4 to generate said digital antenna control signal.

1 Claim 16 (original): The apparatus of claim 15, wherein
2 said antenna control and position routine includes
3 instructions for rotating said antenna pattern through a

4 plurality of positions to select an optimum position based
5 on said at least one measurement value without human input.

1 Claim 17 (original): The apparatus of claim 15, further
2 comprising:

3 stored antenna information received from an
4 antenna device via said serial data bus.

1 Claim 18 (original): The apparatus of claim 17, further
2 comprising:

3 stored antenna channel state information
4 specifying settings to be used for a plurality of
5 controllable antenna features for each of a plurality of
6 receiver channel settings.

1 Claim 19 (original): The apparatus of claim 14, further
2 comprising:

3 a multi-terminal adapter for connecting said
4 apparatus to an antenna device, the multi-terminal adapter
5 including a first terminal for receiving said broadcast
6 signal from the antenna device, a second terminal for
7 supplying power to said antenna device; and a third
8 terminal for coupling said serial bus to the antenna
9 device.

1 Claim 20 (original): The apparatus of claim 14, wherein
2 the received broadcast signal processing circuit is a
3 television signal demodulator circuit.

1 Claim 21 (previously presented): A receiver apparatus,
2 comprising:

3 a tuner for receiving a broadcast signal from an
4 antenna device;
5 a received broadcast signal processing circuit
6 for generating at least one signal measurement value from
7 said received broadcast signal;
8 an antenna controller coupled to said broadcast
9 signal processing circuit for generating digital antenna
10 control signals used to automatically adjust the position
11 of an antenna pattern of said antenna device, the antenna
12 pattern including a plurality of lobes and at least one
13 null so that the null is orientated in the direction of a
14 source of signal interference; and
15 a communications channel for outputting the
16 digital antenna control signals to said antenna device.

1 Claim 22 (original): The receiver apparatus of claim 21,
2 wherein said antenna controller further comprises:
3 means for including antenna gain control
4 information in at least some of said digital antenna
5 control signals.

1 Claim 23 (original): The receiver apparatus of claim 22,
2 wherein said antenna controller further comprises:
3 means for including channel information in at
4 least some of said digital antenna control signals.

1 Claim 24 (original): The receiver apparatus of claim 22,
2 wherein said antenna controller further comprises:
3 means for including antenna polarization
4 information in at least some of said digital antenna
5 control signals.

1 Claim 25 (original): A television, comprising:
2 an antenna device having an electronically
3 steerable antenna pattern, the antenna pattern including at
4 least a front lobe, a rear lobe and at least one null, the
5 antenna device including:
6 a control circuit for controlling the
7 position of said antenna pattern in response to
8 digital control signals;
9 a receiver coupled to said antenna device, the
10 receiver including;
11 a demodulator for demodulating
12 broadcast signals received from said antenna
13 device and for generating at least one signal
14 measurement value; and
15 antenna control circuitry for
16 generating a plurality of said digital control
17 signals to steer said antenna pattern as a
18 function of said at least one signal measurement
19 value; and
20 a display device coupled to said demodulator for
21 displaying images generated from said received broadcast
22 signals.

1 Claim 26 (original): The television of claim 21, further
2 comprising:
3 a television housing for housing both said
4 antenna device and said receiver.

1 Claim 27 (original): The television of claim 21, further
2 comprising:
3 a serial data bus for coupling the antenna
4 control circuitry to the antenna device.

1 Claim 28 (original): The television of claim 27, wherein
2 said antenna control circuitry includes means for
3 determining when said antenna pattern position is in a
4 position which produces less signal interference than at
5 least one other antenna pattern position.

Claim 29 (canceled)

1 Claim 30 (previously presented): ~~The multi-bit antenna~~
2 ~~control signal of claim 29, A multi-bit antenna control~~
3 signal used for controlling characteristics of an antenna,
4 the control signal comprising:
5 a first signal component including a ~~wherein~~
6 ~~said first signal component includes said direction field~~
7 including antenna pattern direction control information,
8 the direction field including at least three bits; and
9 a second signal component, said second signal
10 component including a field which is different from the
11 field included in said first signal component, said second
12 signal component including one of: a gain field including
13 antenna gain information, a channel number field including
14 a channel number, and a polarization field including
15 antenna polarization information.

1 Claim 31 (original): The multi-bit antenna control signal
2 of claim 30, wherein the direction field specifies an
3 antenna pattern direction.

1 Claim 32 (previously presented): The multi-bit antenna
2 control signal of claim 30, wherein said second of signal
3 components includes said gain field, the gain field

4 including at least two bits used to indicate a level of
5 gain to be applied by an amplifier device in said antenna.

1 Claim 33 (previously presented): The multi-bit antenna
2 control signal of claim 30, wherein said first signal
3 component includes said channel number field, the channel
4 number field including at least three bits used to indicate
5 the number of a broadcast channel to be received by said
6 antenna.

1 Claim 34 (previously presented): The multi-bit antenna
2 control signal of claim 30, wherein said first signal
3 component includes said polarization field, the
4 polarization field including at least one bit used to
5 specify one of a plurality of possible antenna
6 polarizations.

Claims 35 and 36 (canceled)

1 Claim 37 (currently amended): ~~The method of claim 36,~~
2 A method of controlling an antenna, the method comprising
3 the steps of:
4 generating at least one digital control signal
5 including a direction information field and at least one of
6 a gain information field, channel number field, and
7 polarization information field, wherein the step of
8 generating at least one digital control signal includes
9 including measuring a signal characteristic of a broadcast
10 signal received by said antenna, said step of measuring a
11 signal characteristic including measuring the signal to
12 noise ratio of said received broadcast signal;

13 transmitting said digital control signal to an
14 antenna; and
15 wherein the method further comprises
16 automatically sending said antenna multiple digital control
17 signals to modify the direction of the antenna pattern of
18 said antenna in an attempt to find a position which results
19 in a satisfactory signal to noise ratio;

1 Claim 38 (currently amended): The method of claim 37 ~~36~~,
2 further comprising the step of:
3 receiving antenna capability information from
4 said antenna.

1 Claim 39 (currently amended): ~~The method of claim 38, A~~
2 method of controlling an antenna, the method comprising the
3 steps of:
4 receiving antenna capability information from said
5 antenna;
6 generating at least one digital control signal
7 including a direction information field and at least one of
8 a gain information field, channel number field, and
9 polarization information field, said step of generating a
10 digital control signal including measuring a signal
11 characteristic of a broadcast signal received by said
12 antenna; and
13 transmitting said digital control signal to an
14 antenna, wherein the step of said transmitting said digital
15 control signal to an antenna includes including the step of
16 transmitting said digital control signal over a serial bus.

1 Claim 40 (original): The method of claim 39, further
2 comprising the step of:

3 supplying direct current power to said antenna
4 over a line which is separate from said serial bus.

1 Claim 41 (original): The method of claim 40, wherein said
2 step of measuring a signal characteristic of a broadcast
3 signal received by said antenna includes:

4 receiving from said antenna the received
5 broadcast signal via a co-axial cable.

Claims 42-53 (Canceled)

1 Claim 54 (previously presented): An apparatus, comprising:
2 an antenna device having an electronically
3 steerable antenna pattern, the antenna pattern including at
4 least first region and a second region, the first region
5 having a higher gain than the second region, the antenna
6 device including:

7 a control circuit for controlling the
8 position of said antenna pattern in response to a
9 digital control signal;
10 a receiver coupled to said antenna device, the
11 receiver including:

12 a demodulator for demodulating
13 broadcast signals received from said antenna
14 device and for generating at least one signal
15 measurement value; and

16 antenna control circuitry for
17 generating a plurality of said digital control
18 signals to steer said antenna pattern as a
19 function of said at least one signal measurement
20 value; and

21 a display device coupled to said demodulator for
22 displaying images generated from said received broadcast
23 signals.

1 Claim 55 (previously presented): The apparatus of claim
2 54, further comprising:
3 a housing for housing both said antenna device
4 and said receiver; and
5 wherein the gain in said first region is at least
6 6 dB higher than the gain in said second region.

1 Claim 56 (previously presented): The apparatus of claim
2 54, wherein said digital control signals are multi-bit
3 signals, the apparatus further comprising:
4 a serial data bus for carrying said multi-bit
5 digital control signals, said serial data bus coupling the
6 antenna control circuitry to the antenna device.

1 Claim 57 (previously presented): The apparatus of claim
2 54, wherein said antenna control circuitry includes means
3 for determining when said antenna pattern position is in a
4 position which produces less signal interference than at
5 least one other antenna pattern position.

1 Claim 58 (previously presented): The apparatus of claim
2 54, wherein said digital control signal includes at least
3 two different control information fields, the two different
4 control information fields being from the group of
5 information fields consisting of: a direction field
6 including antenna pattern direction control information, a
7 gain field including antenna gain information, a channel

8 number field including a channel number, and a polarization
9 field including antenna polarization information.

1 Claim 59 (previously presented): An antenna apparatus for
2 use with a digital communications channel over which a
3 digital control signal including antenna pattern position
4 control information is communicated, the apparatus
5 comprising:
6 control circuitry, coupled to the digital
7 communications channel, the control circuitry including a
8 direction control device for generating at least one
9 antenna pattern position control signal from said digital
10 control signal; and
11 a controllable antenna element assembly having a
12 steerable antenna pattern including a plurality of regions
13 having different gains, the controllable antenna element
14 assembly being responsive to said at least one antenna
15 pattern position control signal;
16 wherein said digital control signal includes an
17 antenna position portion and a channel number portion, and
18 wherein the control circuitry includes channel
19 number processing circuitry for generating a tuning control
20 signal as a function of the channel number portion of said
21 digital control signal.

1 Claim 60 (previously presented): The apparatus of claim
2 59,
3 wherein said apparatus further comprises a tuning
4 circuit coupled to said antenna element assembly, the
5 tuning circuit being responsive to the tuning voltage.

1 Claim 61 (previously presented): An apparatus for use with
2 an antenna device having an electronically steerable
3 antenna pattern, said antenna apparatus supporting a
4 plurality of antenna pattern positions, the apparatus
5 comprising:
6 a receiver having an input for coupling to said
7 antenna device, the receiver including:
8 a demodulator for demodulating broadcast signals
9 received from said antenna device and for generating at
10 least one signal measurement value; and
11 antenna control circuitry for generating a plurality
12 of multi-bit digital control signals to steer said antenna
13 pattern as a function of said at least one signal
14 measurement value, each multi-bit digital control signal
15 including a predetermined position indicator value
16 indicating one of said plurality of antenna pattern
17 positions to which said antenna device is to be steered and
18 a second value used to provide additional antenna device
19 control information.

1 Claim 62 (previously presented): The apparatus of claim
2 61, wherein said second value is a polarization control
3 value.

1 Claim 63 (previously presented): The apparatus of claim
2 61, wherein said second value is a channel number value..

1 Claim 64 (previously presented): The apparatus of claim
2 61, wherein said second value is a gain value.

1 Claim 65 (previously presented): The apparatus of claim 1,
2 wherein said other control value is a polarization control
3 value.

1 Claim 66 (previously presented): The apparatus of claim 1,
2 wherein said other control value is a channel number value.

1 Claim 67 (previously presented): The apparatus of claim 1,
2 wherein said other control value is a channel number value.

1 Claim 68 (previously presented): An antenna apparatus for
2 use with a digital communications channel over which a
3 digital control signal including antenna pattern position
4 control information is communicated, the apparatus
5 comprising:

6 control circuitry, coupled to the digital
7 communications channel, the control circuitry including a
8 direction control device for generating at least one
9 antenna pattern position control signal from said digital
10 control signal; and

11 a controllable antenna element assembly having a
12 steerable antenna pattern including a plurality of regions
13 having different gains, the controllable antenna element
14 assembly being responsive to said at least one antenna
15 pattern position control signal;

16 wherein said digital control signal includes an
17 antenna position control portion and a polarization control
18 portion, and

19 wherein the control circuitry includes a polarization
20 decoder for generating a polarization control signal as a
21 function of the polarization control portion of said
22 control signal.